

## ABSTRACT

A scalable non-blocking switching network (SN) having switches and intermediate (stages of) conductors that are used to connect a first plurality of conductors to other multiple sets of conductors in a generally unrestricted fashion within respective interconnect resources constraints. The SN can be applied in a wide range of applications, in tandem or hierarchically, to provide a large switch network used in network, routers, and programmable logic circuits. The SN is used to connect a first set of conductors, through the SN, to multiple sets of conductors in a given logic circuit hierarchy whereby the conductors in each of the multiple sets are equivalent or exchangeable, which in term, by construction, makes the first set of conductors equivalent when used in the next level of circuit hierarchy. The SN is scalable for large sized sets of conductors and can be used hierarchically to enable programmable interconnections among large sized circuits.